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ORIGINAL RESEARCH

MOTOR DEVELOPMENT OF BRAZILIAN BREASTFEEDING INFANTS IN SOCIALLY UNFAVORABLE CONDITION OF LIFE

Eduardo Queiroz de Mello[1], Sophia Motta-Gallo[1], Flavia Cristina Goulart[1], Dafne Herrero[1], Paulo Rogerio Gallo[1]

Abstract

The early years of life are of essential importance for child development and growth. The child's development in a social vulnerability and unfavorable life condition can be injured, and that early detection of disorders is fundamental for healthy development. **Purpose:** To assessment the Alberta Infant Motor Scale as an assessment tool to identify early of disorders in infants until 18 months. **Methods:** This is an observational, cross-sectional study undertaken in "educational program for the growth and development promotion" at the health unit administered by reference hospital of Health Public System, in Paraisópolis community, São Paulo. The sample (n=71) was composed for infants less than 18 months of age, eutrophic, low biological risk at birth; singleton, full-term births, weight at birth between 2,000g e" and d" 4,500g and no associated congenital neurological, cardiac or orthopedic pathologies at the clinical exam. **Results:** This study presented the greatest prevalence of delay motor neuromotor when compared with the AIMS reference population. First, 8.5% of the breastfeeding infants are classified as being *md*A and 7.0% are classified as *dm*S and secondly that, although the category *md*T contains 84.5% of the children, the median of the z-score has shifted from the central point of the normal standardized distribution, only 33.7% of the children, i.e., 24 in 71, being equal to or above Z=0 ($p<0.05$). **Conclusion:** The use of AIMS was efficient, practice, low cost and quick applies. Plus a quick view of motor milestone presents by infant. Features that became possible take decision by health team.

Key words: neurosensory motor development, breastfeeding infants, assessment tools, AIMS, social vulnerability.

INTRODUCTION

The early years of life are of essential importance for child development and growth. The infant development depends on genetic trends, maturational and continuous interaction with the environment, not only by point of view physical and but psychosocial also[1,2,3]. The child's development in a social vulnerability and unfavorable life condition can be injured since the first year of life, a period so delicate for cerebral and maturational development. Thus, the follow up is essential for early detection of milestones development disorders[4,5].

Infant development assessment standardization by means of instruments for this purpose lends added quality to the exams and reduces the subjectivity of the process as also of the taking of decisions[1,5]. The Alberta Infant Motor Scale (AIMS) is a standardized observational assessment tool whose purpose is to assess and to monitor the gross motor development of infants whether born at full-term or premature, from their birth up to 18 months of age, permitting the detection of any existing deviations[7].

AIMS is an observational measure of infant motor performance which takes into consideration concepts of motor development such as central nervous system maturation, motor dynamic prospects and the assessment of motor development sequence. It is a reference criteria test, with normatized percentage classification which permits to determinate where the individual is situated on an ability measurement or characteristic compared with those of the group of reference[7,1]. Current study with the purpose to compare the original normative data of the Alberta Infant Motor Scale (n=2202) collected 20 years ago with a contemporary sample of Canadian infants has concluded that the sequence and age at emergence of AIMS items has remained similar over 20 years and normative values remain valid[6].

Infants living by unfavorable conditions of life can show development disorders, including the motor aspect. The conditions of: dwelling,

1 Department of Maternal and Child Health, School of Public Health, University of São Paulo, São Paulo, Brazil.
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Corresponding author: sophiamottagallo@usp.br

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income, maternal education, health care access, school access, among others conditions, can have a positive or negative influence on motor development, what could be present in another areas as cognitive and language. This study has a purpose to assessment the Alberta Infant Motor Scale as an assessment tool to identify early of disorders in infants until 18 months.

METHODS

This is an observational, cross-sectional study undertaken in "educational program for the growth and development promotion" at the health unit clinic administered by reference hospital of Health Public System, in Paraisópolis community, São Paulo (city capital). Situated in one of the richest regions at São Paulo, surrounded by luxurious housing estates and it is undergoing a process of urbanization.

The sample (n=71) was composed for infants less than 18 months of age, eutrophic, low biological risk at birth; singleton, full-term births (above 37 weeks' gestational age), weight at birth between 2,000g e" and d" 4,500 g and no associated congenital neurological, cardiac or orthopedic pathologies (exclusion criteria) at the clinical exam. It should be noted that the sample corresponded to about 50% of the total number of breastfeeding infants less than 18 months of age attended by the health unit during the data collection period.

The researcher assessed all the breastfeeding infants by AIMS at the first occasion and a form for the collection of child and its family socio-demographic information was applied. The qualification of the main researcher to apply the AIMS met all the precision demands during the pre-test recorded on video and analyzed by invited specialists.

The AIMS assesses the breastfeeding child in four different positions and for a pre-established number of motor behaviors: prone – 21 items, supine – 9 items, sitting – 12 items and standing - 16 items. The test has attributed a mark for each item: 0 for a behavior unobserved and 1 for an observed behavior. The maximum possible score for a child is 58.

The breastfeeding infants performance was classified on the basis of their gross scores, in percentile groups, as A: Atypical Motor Performance (*md*A percentile d" 5); B: Suspect Motor Performance (*md*S 5 < percentile d" 10) and C: Typical Motor Performance (*md*T >p10). These may then, according to Piper et al. (1992)[8] suggestion, be reclassified in percentile normality groups [*md*T] 10 < percentile d" 25; 25 < percentile d" 50; 50 < percentile d" 75; 75 < percentile d" 90; and percentile > 90.

Each infant was characterized in accordance with his gross AIMS motor development score. The final sample was composed of 57.7% male and 42.3% female infants, aged between 22 days and 17 months. Using the average expected for the age and its respective standard deviation of AIMS[7], the infants z-score was calculated as also their average z-score (including the 95% CI) and the accumulated frequency graph. All the breastfeeding infant with *md*A were referred for treatment at the BHU (Basic Health Unit).

All the infants' mothers, after receiving the necessary guidance, declared themselves, voluntarily, desirous of participating at research project. The study was undertaken after being approved by the Public Health School of the University of São Paulo Research Ethics Committee, in accordance with Resolution 196/96 of the National Health Council, protocol nº 487.

RESULTS

This study presented the greatest prevalence of delay motor neuromotor when compared with the AIMS reference population. It may be observed in table1 that 98.6% of the mothers had attended the pre-natal course,

Table 1: Distribution of breastfeeding infants by some characteristics

Characteristic	Classification	N	%
Pre-natal (nº of visits)	None	1	1.4
	Up to 6	35	49.3
	More than 6	35	49.3
Type of Delivery	Vaginal	41	57.7
	Cesarean	22	31.0
	Forceps	8	11.3
Age group (months)	0 - 4	20	28.2
	4 - 8	30	42.2
	8 - 12	14	19.7
	12 and +	7	9.9
Birth weight (grams)	2.000 - 2,500	9	12.7
	2.500 - 3,300	37	52.1
	> 3,300	25	35.2
Gestational age (weeks)	37 - 40	32	45.1
	40 - 42	39	54.9
Adjustment of Birth Weight by Gestational Age	PIG	10	14.1
	AIG	60	84.5
	GIG	1	1.4
Breast feeding (days)	None	5	7.0
	< 120	34	47.9
	120 < 180	25	35.2
	> 180	7	9.9

vaginal deliveries predominated and median weight at birth was between 2,500 and 3,300 grams. All the newborn were full-term births and 84% of them were adequate gestational age. The proportion (12.7%) of low weight breastfeeding infants at birth should be noted as also that 10 (14.1%) of them were small for gestational age. Maternal breastfeeding was not continued beyond 120 days for more than half the sample.

As regards the socio-economic conditions of the families, the data confirm the mothers as the main care takers (table 2); young women (52% less than 24 years of age), with a low level of education (42,2%). Their dwellings are small

Table 2: Distribution of the breast-feeding infants by social and environmental characteristics

Characteristic	Classification	N	%
Maternal age (years)	< 18	7	9.9
	18 to 24	30	42.3
	25 to 34	29	40.8
	35 and over	5	7.0
Maternal schooling (years' study)	1 to 4	30	42.2
	5 to 8	33	46.5
	9 to 11	8	11.3
Principal care-taker	Mother	64	90.1
	Others	7	9.9
Building material of home	Masonry	63	88.7
	Wood	8	11.3
Piped water	Yes	70	98.6
	No	1	1.4
Electricity	Yes	70	98.6
	No	1	1.4
Bathroom	Own internal	66	93.0
	Own external	5	7.0
Number of rooms	1 to 3	54	76.1
	4 or more	17	23.9
Number of residents per dwelling	3	21	29.6
	4 to 6	40	56.4
	7 to 9	10	14.0

and overcrowded, but provided electricity, piped water and private bathroom. The living conditions of the children and their families, the low level of maternal schooling and the number of residents per dwelling may be taken as life indicators quality. In this context, these variables are understood as determining factors which affect the infants quality of care and show the vulnerability of this age group (breastfeeding infants with *md*A).

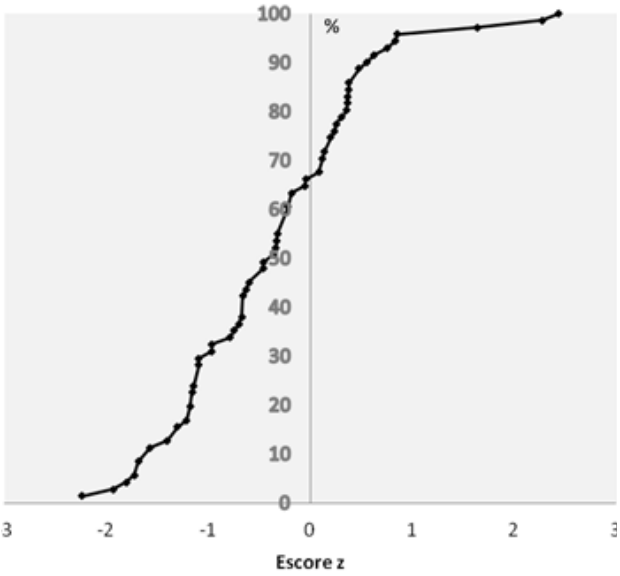
It is noteworthy: first, 8.5% of the breastfeeding infants are classified as being *md*A and 7.0% are classified as *dm*S and secondly that, although the category *md*T contains 84.5% of the children, the median of the z-score has shifted from the central point of the normal standardized distribution, only 33.7% of the children, i.e., 24 in 71, being equal to or above Z = 0 ($p < 0.05$) (table 3 and graph 1).

Table 3: Distribution of breast-feeding infants assessed by classification of motor development (*md*).

Alberta Classification	Alberta		Average Z score (dp)
	n	%	
*md*A*	6	8.5	-1.85 (0.20)
*md*S*	5	7.0	-1.35 (0.14)
*md*T*	60	84.5	-0.15 (0.78)
Total	71	100.0	-0.54 (0.90)

*md*A- motor development A-atypical; S-suspect; T - typical

Graph 1: Distribution of breast-feeding infants by accumulated frequency by z score



DISCUSSION

Poverty makes infant's health vulnerable measured and how restricts the emancipatory care takers power, associating other psychosocial difficulties[20]. We take this aspect to be one of the limitations of AIMS. The use of the norm presented by AIMS in other, culturally different, populations with a distinct health profile has been questioned[9]. Questions as gestational age, low weight at birth, geographic localization appear

also how interference factors about infant development[10,11,21].

However the authors found that AIMS is a suitable tool for these situations which the infants are exposed. The position that remains for a long time, the prematurity, the low weight, different cultures, habits of each country among others specific characteristics are considered sensible during the assessment by Alberta Infant Motor Scale[9,4,10,11].

The score obtained in a Dutch study was significantly less than AIMS norm, 17% being below the 5th percentile and 29% than 10th percentile[12]. 75% of the Dutch assessed children were below the average score expected for their age, a similar pattern at results of this current study and other Brazilian studies[13-15]. Thus the Brazilian infants, as also the Dutch, presented a standard deviation to the left of the median.

The World Health Organization (2006)[16] did assessments at five different countries - Ghana, India, Norway, Oman and the United States – with the purpose of establishing standards of infant gross motor development. The outcomes showed differences at the ages of children had reached the six motor milestones assessed (sitting without support, crawling, standing with support, walking with support, standing and walking without support).

The differences among the countries expressed principally the distinct maternity-care patterns influenced by the specific local cultures, as well as reflecting a range of normality among healthy populations[19].

It is possible that disorders in the cut-off points for the age groups may be sufficient to adapt the AIMS for our population, as suggested by the authors of the scale[17], an initiative also recommended by Lopes et al (2009)[18].

It should be observed that the choice of the cut-off point will depend on the purpose of each assessor or service: removing more breastfeeding infant's delay suspected (sensitivity) or otherwise (specificity) may harm the demands of the services and/or constrain the links with the care takers, in labeling the children concerned as false positives. This is a discussion that leads us into consideration not only of the costs involved but also of the administrative-management priorities definitions at the health services, as also ethical responsibilities required by child care: "*primum non nocere*" – the principle of the Hippocratic ethic.

The reflection into which these situations lead us, beyond the question of technical or methodological adjustments, relates consequences of the living conditions repercussions and social vulnerability which these children and their families are exposed daily and go beyond the reach of the health professional action.

The use of AIMS was efficient, practice, low cost and quick applies. Plus a quick view of motor milestone presents by infant. Features that became possible take decision by health team.

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